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EXAMINER	
CARTER III, ROBERT E	
ART UNIT	**PAPER NUMBER**
2629	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/518,410	IKEDA, HIROSHI	
	Examiner	Art Unit	
	Robert E. Carter	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-4,7-10 and 13-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-4, 7-10, 13-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed on 09/10/2007 has been entered and considered by examiner.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 2, 7-10, 13-15, 17-18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267, Disclosed in IDS submitted on 12/17/2004, copy also submitted on this date) in view of Harris et al. (US Patent # 5,115,228) and further in view of Lee (US Patent # 4,975,691).

As for claim 2, Fukumoto et al. (Figs. 1, 3) discloses:

A display apparatus comprising:

a display panel (1) *whose display can be observed from either side* [0004];

a pair of liquid crystal shutter means (3, 4) *disposed in such a manner as to sandwich said display panel* [0012];

display control means (Fig. 3) *for displaying a first image which can be seen from the one side of the display panel and a second image which can be seen from the other side of the display panel* [0005]; *and*

liquid crystal shutter control means (7) *for opening and closing said pair of liquid crystal shutter means in synchronism with the operation of said display control means in such that they do not open simultaneously, wherein said pair of liquid crystal shutter means are opened and closed by said liquid crystal shutter control means such that said first and second image can be observed as the original display on each side of said display panel* [0015-0016].

Fukumoto et al. does not teach a display control means which displays a first image on one side in one frame and a second image on the other side in the next frame, or an LC shutter control means which opens and closes the pair of shutters for each frame.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses:

display control means (20, 26, 28, 30) *for displaying a first image in every frame or every field which can be seen from the one side of the display panel and a second image which can be seen from the other side of the display panel in every other frame or every other field* (Col. 3, line 50 – Col. 4, line 4); *and*

liquid crystal shutter control means (22, 24) *for opening and closing said pair of liquid crystal shutter means in synchronism with the operation of said display control means in each frame scan or each field scan such that they do not open simultaneously, wherein said pair of liquid crystal shutter means are opened and closed by said liquid crystal shutter control means such that said first and second image can be observed as the original display on each side of said display panel* (Col. 3, line 46 – Col. 4, line 4), *and said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from* **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26)

Fukumoto et al. as modified by Harris et al. does not teach the display control means comprising a scan inverting circuit.

In the same field of endeavor (i.e. EL displays) Lee (Fig. 44) discloses:

wherein said display control means (130, 140, 150, 160, 170) *comprises a scan inverting circuit* (140) *for inverting the direction of a horizontal scan on said display panel in each frame or each field* (Col. 3, line 67 - Col. 4, line 9).

Combining Fukumoto et al., Harris et al., and Lee would meet the claim limitations:

said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from said scan inverting circuit.

Since Fukumoto et al. as modified by Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as modified by Harris et al. with the scan inverting technique taught in Lee, to reduce residual DC voltage across each pixel (Lee, Col. 4, lines 44-50).

As for claim 7, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1), *said display panel being capable of display on both surfaces, namely a first surface and a second surface, thereof* [0004], *first shutter means* (3) *and second shutter means* (4) *disposed on said first surface side and said second surface side, respectively* [0012],

and control means comprising display control means (Fig. 3) *for performing display control such that a first display observed from said first surface side and a second display observed from said second surface side can be viewed as the same display* [0005], *and shutter control means* (7) *for controlling the opening and closing of shutters such that the display picture elements on said second surface side are screened by said*

second shutter means upon said first display, and the display picture elements on said first surface side are screened by said first shutter means upon said second display, wherein said display control means, while switching the display period of said first display and said second display, performs display control such that said first display and said second display have a relationship where they are substantially mirror images of each other upon viewing said first display and said second display from either said first surface side or said second surface side with said shutters open [0015-0016],

Fukumoto et al, does not teach: the display period being a single frame.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses: *wherein said display period, in which said first display and said second display are switched is a unit scan period based on a single field unit or a single frame unit said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from* **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26)

Fukumoto et al. as modified by Harris et al. does not teach the display control means comprising a scan inverting circuit, or the display panel having a plurality of picture elements.

In the same field of endeavor (i.e. EL displays) Lee (Fig. 44) discloses:

A display panel (110) *having a plurality of picture elements* (Fig. 2, intersections of column an row conductors) *that perform display based on an input signal* (column and row drive signals from column drivers 120 and row drivers 122)

said display control means (130, 140, 150, 160, 170) *comprises a scan inverting circuit* (140) *for inverting the direction of a horizontal scan on said display panel in each frame unit or each field unit* (Col. 3, line 67 - Col. 4, line 9).

Combining Fukumoto et al., Harris et al., and Lee would meet the claim limitations:

said first and second shutter means being capable of opening and closing for a plurality of picture elements;

said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from said scan inverting circuit.

said display panel being capable of display on both surfaces, namely a first surface and a second surface, thereof, using a picture element at a selected location;

Since Fukumoto et al. as modified by Harris et al. teaches a first and second shutter means capable of opening and closing for the entire display, and Lee teaches a display having a plurality of picture elements, the obvious combination of the references teaches a first and second shutter means capable of opening and closing for a plurality of picture elements (the entire display).

Since Fukumoto et al. as modified by Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a

scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

Since Fukumoto et al. as modified by Harris et al. teaches a display panel capable of display on both surfaces, and Lee teaches a display having a plurality of picture elements, the obvious combination of the references teaches a display panel capable of display on both surfaces using a picture element at a selected location.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel and display control means in Fukumoto et al. as modified by Harris et al. with the display having a plurality of picture elements and the scan inverting technique taught in Lee, to reduce residual DC voltage across each pixel (Lee, Col. 4, lines 44-50).

As for claim 8, Harris et al. teaches:

wherein said shutter control means controls the opening and closing of shutters in synchronism with the switching of said display period by said display control means (Col. 2, lines 44-48).

As for claim 9,

wherein said control means comprises:

A memory circuit for storing a data signal in each scan unit of said picture element based on said input signal (Col. 25, lines 65 – Col. 26, line 3).

said scan inversion circuit (Fig. 1) *for inverting the scan order in each said scan unit* (Col. 1, lines 6-9, Fig. 1, # 110).

A signal driving circuit (Fig. 1) for outputting a data signal to said display panel *(Col. 1, lines 6-9, Fig. 1, # 110)* in order *to perform a first image display by said scan order and a second image display by the inverted scan order based on an inverted scan signal at different times, based on said data signal stored in said memory circuit and said inverted scan signal outputted from said scan inverting circuit* (Fig. 1, # 130, 140), (Col. 25, lines 65 – Col. 26, line 3).

A signal inverting circuit (164) *for inverting the inverted scan signal outputted from said scan inverting circuit.*

Lee does not teach a shutter switching circuit.

Harris et al. teaches:

a shutter switching circuit (26, 28) *for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from* **a scanning** *circuit* (42, 44)*, wherein, upon alternatively displaying either said first display or said second display outputted from said signal driving circuit in each said scan unit, the display surface side on which display has not been selected is screened alternatively by said first or second shutter means* (Col. 2, lines 44-48).

Combining Fukumoto et al., Harris et al. and Lee would meet the claim limitations:

a shutter switching circuit for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from said scan inverting circuit.

Since Fukumoto et al. as modified by Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

As for claim 10, Fukumoto et al. teaches:

wherein said first and second shutter means are formed by liquid crystal panels disposed on said first display surface and said second display surfaœ, respectively, in an opposing manner [0006], [0012].

As for claim 13, Lee teaches:

A scan inversion symmetric drive circuit (Fig. 1) *for inverting the scan order in each said scan unit while driving an electroluminescent display panel (Col. 1, lines 6-9, Fig. 1, # 110). Said scan inversion symmetric drive circuit capable of performing display control such that in each unit scan period based on a single field unit or a single frame unit, said first display and said second display have a relationship where they are substantially mirror images of each other upon viewing said first display and said second display from either said first surface side or said second surface side with said shutters open (Col. 3, line 67 - Col. 4, line 9).*

A memory circuit for storing a data signal in each scan unit of said picture element based on said input signal (Col. 25, lines 65 – Col. 26, line 3).

A scan driving circuit (Fig. 1, # 130, 140) for providing a scan driving signal to said display panel in the scan order of each said scan unit (Col. 8, lines 26-31).

A signal driving circuit (Fig. 1) for changing the output order of said image signal received from a memory circuit (Col. 25, lines 65 – Col. 26, line 3) in each scan order, while outputting to the display panel (Col. 1, lines 6-9, Fig. 1, # 110) an image signal that is used to perform a first image display by said scan order and a second image display by the inverted scan order based on an inverted scan signal at different times, based on said data signal stored in said memory circuit and the scan driving signal outputted from the scan driving circuit (Fig. 1, # 130, 140).
A signal inverting circuit (164) *for inverting the inverted scan signal outputted from said scan inverting circuit.*

Lee does not teach a shutter switching circuit.

Harris et al. teaches:

a shutter switching circuit (26, 28) *for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from* **a scanning** *circuit* (42, 44), *wherein, upon alternatively displaying either said first display or said second display based on said image signal outputted from said signal driving circuit in each said scan unit, the display surface side on which display has not been selected is screened alternatively by said first or second shutter means* (Col. 2, lines 44-48).

Combining Fukumoto et al., Harris et al. and Lee would meet the claim limitations:

a shutter switching circuit for controlling the opening and closing of said first shutter

means and said second shutter means based on an output signal from said scan inverting circuit.

Since Fukumoto et al. as modified by Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

As for claim 14, Fukumoto et al. teaches:

wherein said first and second shutter means are formed by liquid crystal panels disposed on said first display surface and said second display surface, respectively, in an opposing manner [0006], [0012].

As for claim 15, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1), *said display panel being capable of display on both surfaces, namely a first surface and a second surface that is opposite to said first surface, thereof* [0004],

first shutter means (3) *and second shutter means* (4) *disposed on said first surface side and said second surface side, respectively* [0012]

control means comprising display control means (Fig. 3) *for performing display control of a first display observed from said first surface side and a second display, which is different from said first display, observed from said second surface side, and shutter control means for controlling said shutter means such that a regular image can be observed from both surfaces of said display panel, wherein the control of*

the opening and closing of shutters are performed such that the display picture elements on said second surface side are screened while transmitting the display picture elements on said first surface side by said second shutter means upon said first display, and such that the display picture elements on said first surface side are screened while transmitting the display elements on said second surface side by said first shutter means upon said second display [0015-0016],

Fukumoto et al. does not teach the LC shutter control means for displaying a regular image on both sides of the display simultaneously.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses: *shutter control means* (22, 24) *for controlling said shutter means such that a regular image can be observed simultaneously from both surfaces of said display panel* (Col. 3, line 46 – Col. 4, line 4),

said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26).

Fukumoto et al. as modified by Harris et al. does not teach the display control means comprising a scan inverting circuit, or the display panel having a plurality of picture elements.

In the same field of endeavor (i.e. EL displays) Lee (Fig. 44) discloses:
A display panel (110) *having a plurality of picture elements* (Fig. 2, intersections of column an row conductors) *that perform display based on an input signal* (column and row drive signals from column drivers 120 and row drivers 122).
said display control means (130, 140, 150, 160, 170) *comprises a scan inverting circuit* (140) *for inverting the direction of a horizontal scan on said display panel in each frame unit or each field* (Col. 3, line 67 - Col. 4, line 9).

Combining Fukumoto et al., Harris et al., and Lee would meet the claim limitations:
first shutter means and second shutter means disposed on said first surface side and said second surface side, respectively, that are capable of opening and closing for a plurality of picture elements; and
said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from said scan inverting circuit.
said display panel being capable of display on both surfaces, namely a first surface and a second surface that is opposite to said first surface, thereof, using a picture element at a selected location;

Since Fukumoto et al. as modified by Harris et al. teaches a first and second shutter means capable of opening and closing for the entire display, and Lee teaches a

display having a plurality of picture elements, the obvious combination of the references teaches a first and second shutter means capable of opening and closing for a plurality of picture elements (the entire display).

Since Fukumoto et al. as modified by Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

Since Fukumoto et al. as modified by Harris et al. teaches a display panel capable of display on both surfaces, and Lee teaches a display having a plurality of picture elements, the obvious combination of the references teaches a display panel capable of display on both surfaces using a picture element at a selected location.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel and display control means in Fukumoto et al. as modified by Harris et al. with the display having a plurality of picture elements and the scan inverting technique taught in Lee, to reduce residual DC voltage across each pixel (Lee, Col. 4, lines 44-50).

As for claim 17, Harris et al. teaches:

wherein the display control means (20, 26, 28, 34) *of said display panel* (10) *and said shutter means* (16, 18) *are controlled by the same circuit* (34).

As for claim 18, Fukumoto et al. teaches:

A terminal apparatus comprising the display apparatus according to claim 2 (Paragraphs [0020-0021], Fig. 3).

As for claim 19, this claim is identical to claim 13, and therefore is rejected in the same manner as claim 13.

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267, Disclosed in IDS submitted on 12/17/2004, copy also submitted on this date) in view of Harris et al. (US Patent # 5,115,228) and Lee (US Patent # 4,975,691) and Kanemori et al. (US Patent # 5,164,851) and further in view of Liang et al. (US Publication # 2003/0035198).

As for claim 3, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1) *wherein display can be observed from either side of said display panel* [0004];

a pair of liquid crystal shutter means (3, 4) *disposed in such a manner as to sandwich said display panel* [0012],

liquid crystal shutter control means (7) *for controlling said liquid crystal shutter means such that when one liquid crystal shutter corresponding to said single picture element field is put in a transmitting state, by putting the other liquid crystal shutter into a light-blocking state, and, when one liquid crystal shutter corresponding to the other single picture element field is put in the light-blocking state, by putting the other liquid crystal shutter into the transmitting state* [0015-0016]; *and*

display control means (Fig. 3), [0005].

Fukumoto et al, does not teach the display having a picture elements each including a plurality of display elements.

In the same field of endeavor (i.e. EL displays) Kanemori et al. (Fig. 3) discloses:

a display panel (Col. 1, lines 14-16) *having a plurality of picture elements* (40, Col. 1, lines 16-19), *each including a plurality of display elements* (41, 42) *as a single unit,*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the EL display in Fukumoto et al. with the one having a plurality of picture elements including a plurality of display elements in Kanemori et al, to allow for easy correction of pixel defects to improve yield and reduce cost (Kanemori et al., Col. 4, line 63 – Col. 5, line 3)

Fukumoto et al. as modified by Kanemori et al. does not teach the LC shutter control means for displaying a regular image on both sides of the display simultaneously.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses:

liquid crystal shutter control means (22, 24) *for controlling said liquid crystal shutter means such that a regular image can be observed simultaneously from both surfaces of said display panel* (Col. 3, line 46 – Col. 4, line 4),

said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal

shutter means in Fukumoto et al. as modified by Kanemori et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26)

Fukumoto et al. as modified by Kanemori et al. and Harris et al. does not teach the display control means comprising a scan inverting circuit.

In the same field of endeavor (i.e. EL displays) Lee (Fig. 44) discloses: *display control means* (130, 140, 150, 160, 170) *comprising a scan inverting circuit* (140) *for inverting the direction of a horizontal scan on said display panel in each picture element field* (Col. 3, line 67 - Col. 4, line 9).

Combining Fukumoto et al., Kanemori et al., Harris et al., and Lee would meet the claim limitations:
said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from said scan inverting circuit.

Since Fukumoto et al. as modified by Kanemori et al. and Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as

modified by Kanemori et al. and Harris et al. with the scan inverting technique taught in Lee, to reduce residual DC voltage across each pixel (Lee, Col. 4, lines 44-50).

Fukumoto et al. as modified by Kanemori et al. and Harris et al. and Lee does not teach the shutters being able to open and close for a single picture element.

In the same field of endeavor (i.e. displays using LC shutters) Liang et al. discloses:

An electrophoretic display using an overlaid LC shutter to switch each pixel to a black color [0011 – 0012].

Combining Fukumoto et al., Kanemori et al., Harris et al., Lee, and Liang et al. would meet the claim limitations:

said pair of liquid crystal shutter means being provided for said display panel comprising a plurality of said picture elements, wherein said pair of liquid crystal shutter means includes liquid crystal shutter means that can open and close in each single display picture element field corresponding to said single picture element;

Since Fukumoto et al. as modified by Kanemori et al., Harris et al. and Lee teaches a pair of liquid crystal shutters sandwiching a display, which open and close for a plurality of picture elements (the entire display), and Liang et al. teaches a display overlaid with an LC shutter capable of opening and closing for a single picture element, the obvious combination of the references teaches a pair of LC shutters which open and close for a single picture element.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shutters in Fukumoto et al. as modified by

Kanemori et al., Harris et al., and Lee, with the shutters which can open and close for a single picture element in Liang et al. to improve color saturation and contrast ratio (Liang et al., [0014]).

As for claim 4, Harris et al. teaches:

The display apparatus according to claim 3, wherein said display control means causes said mirror image to be displayed alternately in each horizontal scan by the one set and the other set of said single picture element (Col. 3, line 46 – Col. 4, line 4).

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267, Disclosed in IDS submitted on 12/17/2004, copy also submitted on this date) in view of Harris et al. (US Patent # 5,115,228) and Lee (US Patent # 4,975,691) and further in view of Liang et al. (US Publication # 2003/0035198).

As for claim 16, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1) *having a first display surface and a second display surface and capable of display from both surfaces, namely, said first display surface and said second display surface* [0004];

first shutter means (3) *and second shutter means* (4) *disposed on said first surface side and said second surface side, respectively* [0012],

control means comprising display control means (Fig. 3) *for performing display control of a first display observed from said first display surface side and a second display,*

which is different from said first display, observed from said second display surface side [0005], *and liquid crystal shutter control means* (7) *for controlling said first and second shutter means such that a regular image can be observed from both surfaces of said display panel by screening the display picture elements on said second display surface side while transmitting the display picture elements on said first display surface side by said second shutter means upon said first display, and by screening the display picture elements on said first display surface side while transmitting the display elements on said second display surface side by said first shutter means upon said second display* [0015-0016].

Fukumoto et al. does not teach the LC shutter control means for displaying a regular image on both sides of the display simultaneously.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses: *liquid crystal shutter control means* (22, 24) *for controlling said liquid crystal shutter means such that a regular image can be observed simultaneously from both surfaces of said display panel* (Col. 3, line 46 – Col. 4, line 4),
said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. with the operation of the ones in Harris et al, to allow

display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26)

Fukumoto et al. as modified by Harris et al. does not teach the display control means comprising a scan inverting circuit.

In the same field of endeavor (i.e. EL displays) Lee (Fig. 44) discloses: *said display control means* (130, 140, 150, 160, 170) *comprises a scan inverting circuit* (140) *for inverting the direction of a horizontal scan on said display panel in each frame or each field* (Col. 3, line 67 - Col. 4, line 9).

Combining Fukumoto et al., Harris et al., and Lee would meet the claim limitations:

said liquid crystal shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from said scan inverting circuit.

Since Fukumoto et al. as modified by Kanemori et al. and Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and Lee teaches a scanning circuit with scan inverting capabilities, the obvious combination of the references teaches an LC shutter controller means which opens and closes the LC shutters in response to an output from a scan inverting circuit.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as

modified by Kanemori et al. and Harris et al. with the scan inverting technique taught in Lee, to reduce residual DC voltage across each pixel (Lee, Col. 4, lines 44-50).

Fukumoto et al. as modified by Harris et al. and Lee does not teach the shutters being able to open and close for a single display element.

In the same field of endeavor (i.e. displays using LC shutters) Liang et al. discloses:

An electrophoretic display using an overlaid LC shutter to switch each pixel to a black color [0011 – 0012].

Combining Fukumoto et al., Harris et al., Lee, and Liang et al. would meet the claim limitations:

first shutter means and second shutter means disposed on said first surface side and said second surface side, respectively, that are capable of opening and closing for each said display element;

Since Fukumoto et al. as modified by Harris et al. and Lee teaches a pair of liquid crystal shutters sandwiching a display, which open and close for a plurality of display elements (the entire display), and Liang et al. teaches a display overlaid with an LC shutter capable of opening and closing for a single display element, the obvious combination of the references teaches a pair of LC shutters which open and close for a single display element.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shutters in Fukumoto et al. as modified by Harris et al. and Lee, with the shutters which can open and close for a single picture

element in Liang et al. to improve color saturation and contrast ratio (Liang et al., [0014]).

Response to Arguments

1. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

In view of the amendment, the references Harris et al. and Liang et al. have been added for a new ground of rejection.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert E. Carter whose telephone number is 571-270-3006. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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